

INTRODUCTION

This project completion report contains results of a one-year scoping study of sediments in the APES (Albemarle Pamlico Estuarine Study) region of eastern North Carolina. The overall goal of the project was to provide a comprehensive summary of our state-of-knowledge of the origin of sediments, their composition and size, and their inferred dispersal and flux within the Albemarle-Pamlico system. The basis for the study was archived data published over the last 30 years and new, unpublished data, collected over the last 18 months. The project was initiated in direct response to Tasks E.6 (Sediment Distribution and Motion) and E.15 (Chronic Effects of Suspended Sediments) of the Water Quality and Estuarine Relationships section of the original APES Call for Proposals (May 1987).

Specific objectives of the project were to 1) collate, for the first time, approximately 25 data sets from maps of various small scales onto a series of base maps from which the diagnostic characteristics of the bottom sediments could be described, 2) provide a regional survey of suspended sediments under several different environmental conditions using Landsat Thematic Mapper (TM) imagery, and 3) determine inferred pathways of sediment dispersal, vertical flux rates, and probable short-term deposition and long-term accumulation sites for the most mobile sediments, the mud fraction. As the first basin-wide description of bottom and suspended-sediment character, this study was designed to: serve as a reference for benthic habitat studies in which substrate could be a critical factor; provide a first-order map showing potential storage sites for sediments of different sizes and composition; provide an index for sediment resuspension, where resuspension threshold is governed largely by grain size; and, characterize bottom type in such a way that it could be used as input to future modeling studies of water motion and sediment dispersal.

Rationale for Study

Sediments will surely play an increasing role in future management of the Albemarle-Pamlico estuarine system. In shallow-water regions, such as the APES area (Fig. 1), the water column and surficial sediments interact continually, exchanging and redistributing particles and solutes so as to impact the operation of the entire system. Consideration of sedimentary processes and their dynamics in the estuaries is therefore essential in addressing water quality issues, and research into these processes is a vital part of any system-wide management effort. However, in contrast to the water, the sediments are often an unseen and apparently passive component in an estuary. Sediment distribution and properties are slow to change, and their role in water-column events is not always apparent. Yet, sediments may play a critical role in transporting pollutants, modulating productivity, and releasing nutrients.